# School Shop

vol. XVIII no. 10
JUNE 1959

**Industrial Arts Can Help Philippines**
by Gordon O. Wilber
**Watering Cans**
by Ruthford E. Smuts
**Equipping Electronics Shops**
by Paul B. Zbar
**Jewelry—Made of Wire**
by Harry J. Miller

Cover Story: A Denver, Colo., industrial-arts student working on silver jewelry. Jewelry making can be taught at many grade levels. For an elementary jewelry-making project, turn to page 14. Instead of silver, the basic material used is copper wire.

THE MAGAZINE FOR TEACHERS OF INDUSTRIAL EDUCATION

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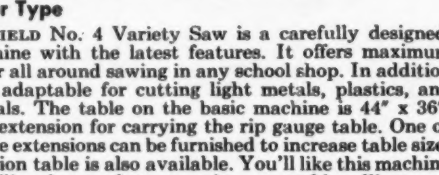

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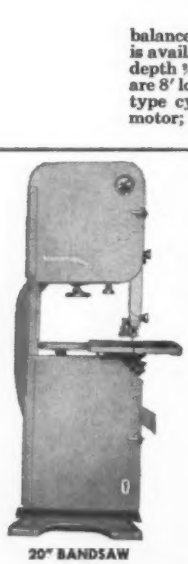

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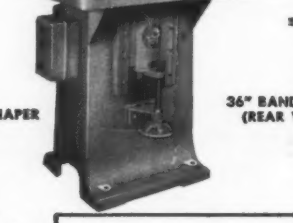

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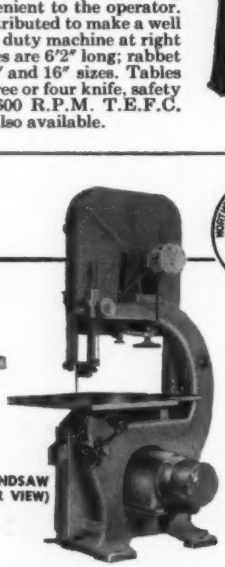

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# School Shop

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**Vol. XVIII, No. 10** **June, 1959**

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BPA

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# School Shop TALK

## COMMENTS ON ISSUES FACING INDUSTRIAL EDUCATION

### A New Job for Drafting Teachers?

We are perturbed at the way most of our engineering colleges are reducing the time students spend on drafting to a single semester or even none at all. The reason given for this curtailment is that so much new material has been added to the engineering curriculum that something had to be cut out.

The reasonableness of the need for elimination of something can be understood, but it is difficult to understand why those responsible for the change should decide to weaken the foundation of the engineering profession.

Drafting is the language of the engineer. He may be chock full of original ideas and proficient in the application of mathematics and science that could lead to the revolutionizing of industrial practice. But, if he is unable to convey these ideas to his associates who bring his ideas into being, his knowledge and creative ability are relatively useless.

The mastery of this means of communication cannot be developed in a single semester. All we can expect is that the student in that short time will be in the same position as the foreign-language student who learns to conjugate but who is unable to use the language.

If this trend continues, engineering colleges may require for entrance that all freshmen have a working knowledge of drafting—the language of the engineer. This will mean that the high-school teacher of drafting with pre-engineering students in his classes must step up his course content to the point where his students will be well prepared in the art of presenting ideas visually.

We may be off base on this prediction, but we think the odds are in our favor that the high schools ultimately will be pressed to do the drafting teaching job for engineering students.—*T. D.*

### Let's Make It Permanent

Industrial training problems during World War I led to the enactment of the Smith-Hughes law on which our present vocational-education program is founded. Again, during World War II the lack of trained workers for our complicated war machine led to the war-production training and preinduction training programs. So critical was the need for technicians then that a national committee under the auspices of the U. S. Office of Education came up with an excellent report on what was needed entitled, *Vocational-Technical Training for Industry*. This did much to stimulate the excellent war-training program and pointed up long-term industrial-education needs. The last, however, were largely ignored, once the war emergency passed.

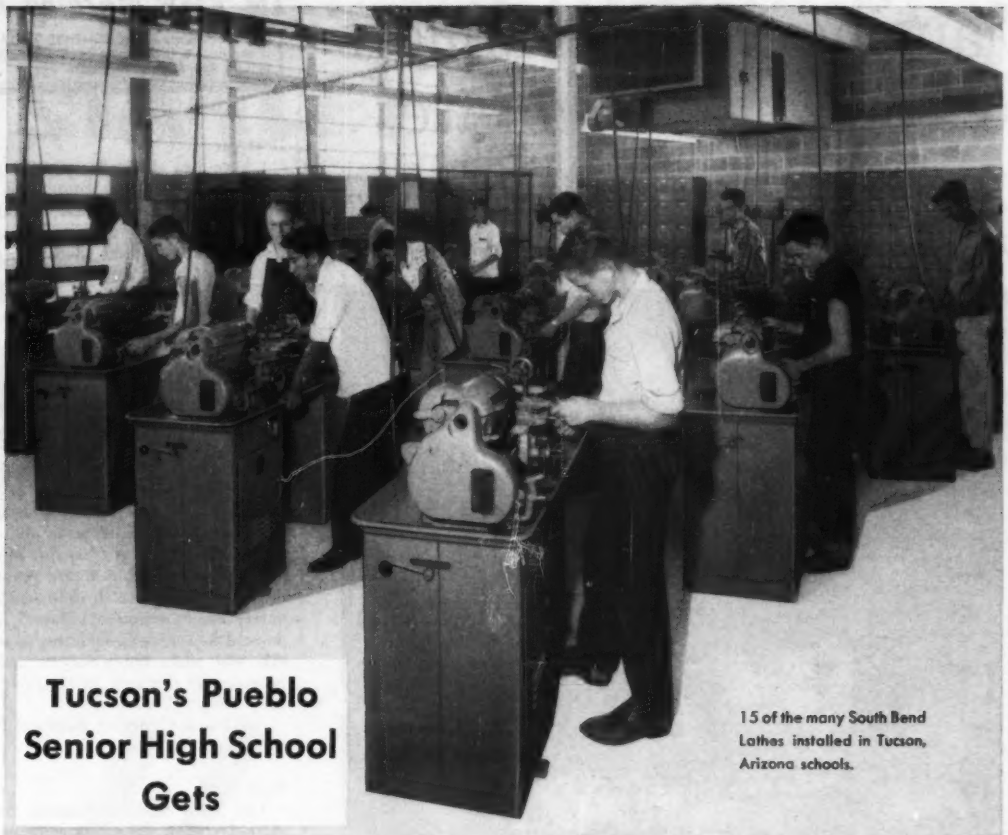
Now the emphasis on technician training is popularly believed to be the result of the first Russian sputnik when actually it is a reawakening to an educational need that has become more acute as man's activities have become more complex.

It is imperative that training be provided for the many thousands of people who are required to build, operate, and maintain the complicated equipment that man has come to accept as a necessary part of his daily life.

This type of training requires more theory than is needed by the mechanic but less than is required by the professional engineer. The title of USOE Bulletin 228, *Vocational-Technical Training*, is a good distinguishing label for this type of work. However, we are less interested in labels than in what is done in schools.

Probably the greatest source of students for technician training is in our high schools, but we must not forget the huge army of mechanics who can be upgraded. This means that late afternoon, evening, and Saturday classes must be provided for their convenience.

Let us not make the mistake of creating a temporary program to relieve the shock of sputnik. Rather, let us build on a permanent basis and add to it as the need becomes evident. Only by doing this can we hope to keep pace with technological advancement and capitalize on the potential genius of the American people.—*T. D.*



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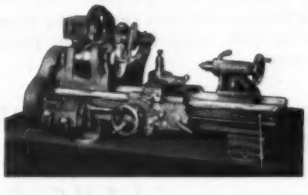

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## IN THE *Morning Mail..*

[Brief comments about SCHOOL SHOP and the field it serves are invited. Address the Editor, SCHOOL SHOP, Ann Arbor, Michigan.

Dear Sir:

I have just received and read most of the April issue of SCHOOL SHOP, and I hasten to congratulate you and that liberal Scotsman, Professor Tom Diamond, for putting out a very fine issue on technical education.

The articles included in the April issue should give your readers a much better understanding of technical education. Congratulations on the fine magazine!

*H. H. London,*
President, American Vocational Association,
Professor of Industrial Education.
University of Missouri, Columbia.

Dear Sir:

I've read many good issues of your magazine, but you have shown unusual vision in devoting the April issue to the technicians.

I've learned things from this issue that will guide my thinking in future years. You have done a great service to shop teachers.

I'd like to see this followed by an issue devoted to a more specific treatment of how all this will affect industrial-arts and vocational programs in the next 10-20 years.

*Dana H. Prouty,*
Ralph C. Maher Regional High School
Orange, Mass.

Dear Sir:

The April issue of SCHOOL SHOP arrived yesterday. You are to be congratulated for a remarkably fine coverage of technical education. You have done very well in securing a balance in description of types of programs and points of view.

*Burr D. Coe,*
President,
American Technical Education Assn.
New Brunswick, N.J.

Dear Mr. Editor of Skool Shop:

I guess its allright for you maggizine to go fansy al of a sudden and giv us readors all of those pitures and pfilosofy about what we aught to teach but where are the projects and drawings from which we kan teache all of them teknician things! We have a seventh and eighth grade wood shop and want to train technikians in wood tecknowledgy and get sum of this guverment money to buy a band saw and a compount mitter box. This change in owr prowgram will make it just like Mr. Conant and Rickover said it should be for them homogenized kids we have in our 8 grade especially.

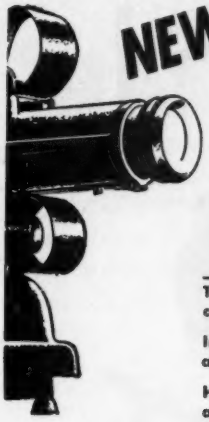
Kan you and Mistre Dimond Dust help us get this for owr skool and train tecknicians for the Federal Nationla Defence? We would like to get owr money by April 15 so we can order our saw and mitter box fore next year and train those tecknicians for our countries nasonal defence.

*Yelwah Y. Nodnarb,*
Cheef, Teknician Training, Wood Tec.
S. Klondike Tech. Institute
Yukon, N.D.

P.S. Please dont forget the projects next month.

*(Editor's Note: A careful scrutiny of the Postal Guide reveals no such place as Yukon, N.D. The envelope in which the letter was sent was postmarked East Lansing, Mich.)*

# STANLEY SHOP TALK



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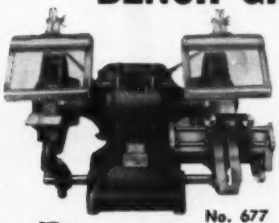

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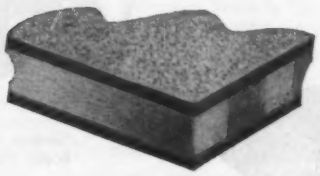

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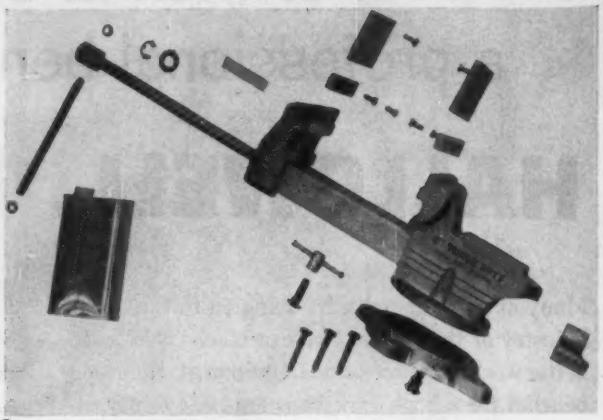
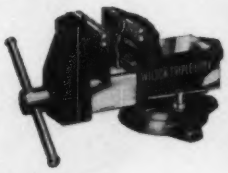


*Unfinished Woodworker's Vise*

*Finished Woodworker's Vise*

*Unfinished 4" Bench Vise*



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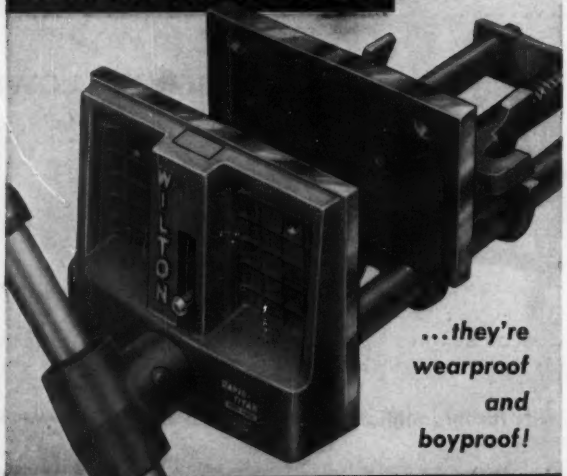
## WOODWORKERS' VISES

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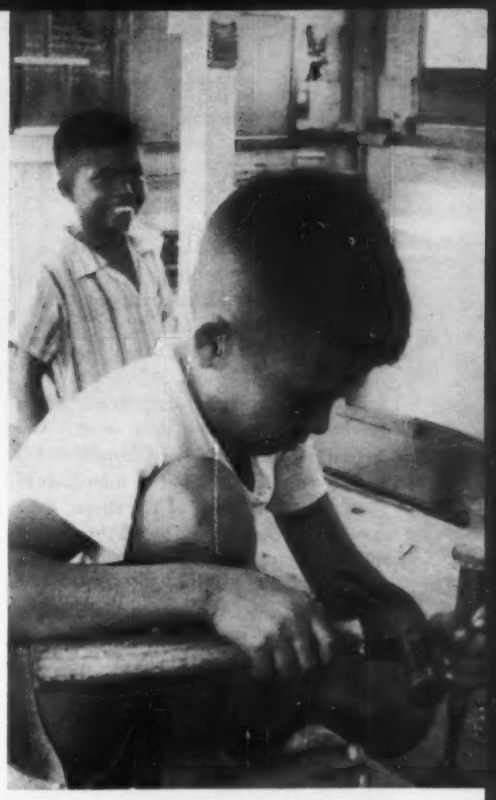
The economy is agricultural but

# Industrial Arts Can Help Philippines Reach the "Good Life"

*By Gordon O. Wilber*

Leader, Stanford University Team in The Republic of the Philippines; Retired Head, Industrial-Arts Department, Oswego, N.Y., State Teachers College



This Filipino youngster doesn't have a vise to hold the job he is working on so he uses the next best thing available to him: his feet.

THE young Republic of the Philippines is making a supreme effort to lift itself, economically and politically, by an improved educational program. Educational leaders are acutely aware of the contributions that industrial arts can make to the general education of the citizen, as well as to preparation for industrialization. The recognition of this need led to the setting up of a contract between the International Cooperation Administration (ICA) and the Philippine Department of Education to supply a contract team of four industrial-arts specialists to help in raising the level of industrial-arts teacher education. Stanford University was selected to assume the responsibility for this contract along with its other educational commitments in the Philippines.

Three schools in the Philippines are now engaged in preparation of industrial-arts teachers—the Philippine School of Arts and Trades at Manila; the Iloilo School of Arts and Trades, at Iloilo City; and the Cebu School of Arts and Trades, at Cebu City. Iloilo School of Arts and Trades was selected as the center where the Contract Team would be placed. The basis for this decision probably rested, at least in part, on the fact that Iloilo is the most centrally located of the three teacher-education schools.

The Contract Team has now been in the Philippines for approximately a year and a half. Aside from efforts to improve teacher education, considerable time has been devoted to studying the present industrial-arts program in the Philippines and in an attempt to analyze its needs and problems. It is believed that readers in the United States will be interested in some of these observations:

1. A program of "Work Education" is prescribed for all elementary schools. This includes elementary industrial arts, agriculture, and home economics. In the first four grades these activities are usually handled by the regular classroom teacher and carried on in the classroom. Industrial arts at this level consists largely of work in native crafts using locally available materials. Some toy making and coping-saw work has also been observed.

2. According to present regulations, pupils in the fifth grade are required to take elementary agriculture. This work consists largely of elementary gardening with some landscaping and horticulture in connection with maintenance and improvement of school grounds.

3. All sixth-grade boys are required to take industrial arts. (There are no seventh or eighth grades in Philippine schools at the present time. Pupils pass directly from the sixth grade to the four-year high school.) The first semester is supposed to be devoted to handicrafts and the second to general shop. However, many teachers are now combining the two types of work, and considering handicrafts as one area of the general shop.

4. Under a new law now in effect, but not fully implemented, industrial arts must be offered in the first two years of all general high schools, and vocational work must be offered during the last two years. Most high schools—these are supported solely from tuition fees—do not, as yet, have the necessary equipment to offer these courses.

5. Few of the present teachers have had specific preparation for teaching industrial arts. Most of them are graduates of two- or three-year industrial-teachers courses, and have specialized in a single trade area. Partly, at least, as a result of this lack of breadth in preparation, industrial arts in the Philippines has not, except in a few isolated instances, followed the trend toward enrichment that has characterized the program in the United States.

6. Another limiting factor is the inadequate equipment found in most shops. Readers in the United States cannot appreciate the devastating effect the war has had on Philippine schools. Most prewar school buildings were destroyed and the tools and equipment either confiscated or lost. The present program, therefore, is almost wholly the result of postwar efforts. It is not unusual to find schools where there are only 20 to 25 hand tools of various kinds and one or two vises to serve classes of 30 to 50 pupils.

7. Probably the most serious problem facing industrial arts in the Philippines is the complete lack of instructional

supplies. In order to understand this fact it must be understood that education in the Philippines is a highly centralized function of the federal government. All policy, including the matter of financial support, comes from the Bureau of Public Schools in Manila. There is no local taxation specifically for support of education, and although education is the second highest item in the national budget, there is not enough money to meet the needs. Thus, it becomes necessary for pupils to supply all of the materials with which they work. Most parents do not have the financial ability to buy even a minimum of materials for their children. Most of the shops, therefore, are forced to depend exclusively on those supplies that are readily available in the community, and which can be acquired free by the pupils. Members of the Stanford Team were at first inclined to be amused at references to the "bamboo and coconut shell curriculums" but they have come to realize that in too many cases these terms accurately represent the sum total of industrial-arts supplies available to pupils. Picture, if you can, the problems involved in running an industrial-arts program with only these two materials available!

Filipino pupils weaving mats from bamboo splints. Most shops rely heavily on materials available in community.

8. The system of strict accountability for both supplies and equipment is also an important consideration for the Philippine teacher. The teacher is held *personally* responsible for all equipment under his supervision. If a tool is lost, it must be replaced by the teacher. This regulation has led to keeping expensive tools and equipment in locked storage rather than to run the risk of loss. If supplies are purchased from school funds, as is sometimes the case for building school furniture, etc., the same regulation applies. The end use of each piece of lumber or item of hardware must be reported.

9. Classes are in general too large for effective work. Groups of from 30 to 50 are not unusual. A recent regulation reducing the maximum class size from 60 to 40 pupils has, as yet, not been implemented in most schools. Overcrowded classes, coupled with lack of adequate tools and equipment, seriously limit what can be accomplished by even the best teachers.

10. A complete lack of electrical power in school shops results in limitations that the United States teacher will find difficult to appreciate. The government is making heroic efforts to extend electrification to the rural areas, but little progress has been made. It is reported that not a single school shop in the Province of Iloilo (which corresponds roughly to a state), outside of Iloilo City, has electrical power.

11. The rapid drop-out rate in Philippine schools is also a factor that influences industrial-arts education. Out of 100 pupils starting grade one, only 18 can be expected to finish grade six, and only four will complete high school. This means that, for the greater part of the population, industrial arts can be effective only at the elementary level. It also implies that for most children the elementary school represents terminal education. It might be expected, therefore, that industrial arts would emphasize vocational skills to a greater degree than might be justifiable in the United States.

It should not be assumed, however, that there isn't any good work being done in the Philippine industrial-arts shops. Most of the teachers, despite the difficulties under which they work, are devoted and dedicated to their programs. They work much longer hours than do their counterparts in the United States. In many cases they even go so far as to spend their own money to supplement tools and supplies available in shops. Most of the better work now being done is in native crafts, and the poorest is where the teacher is trying to copy projects from American publications that do not fit the needs of this society.

The reader might well ask at this point, "What should be the nature and purposes of industrial arts in the Philippines?" The Stanford Team has given much thought to this matter and their tentative conclusions can be summarized as follows:

The Philippine society at present is

(*Continued on page* 18)

Below is a photograph of a typical industrial-arts class in a Philippine school. Note lack of power equipment. What few hand tools are available are used and others are stored (note toolroom in back).

From shortening and soup cans come

# Watering Cans

Three completed florists' watering cans that can be turned out on a mass-production basis. Their cost is low but their take-home appeal is high.

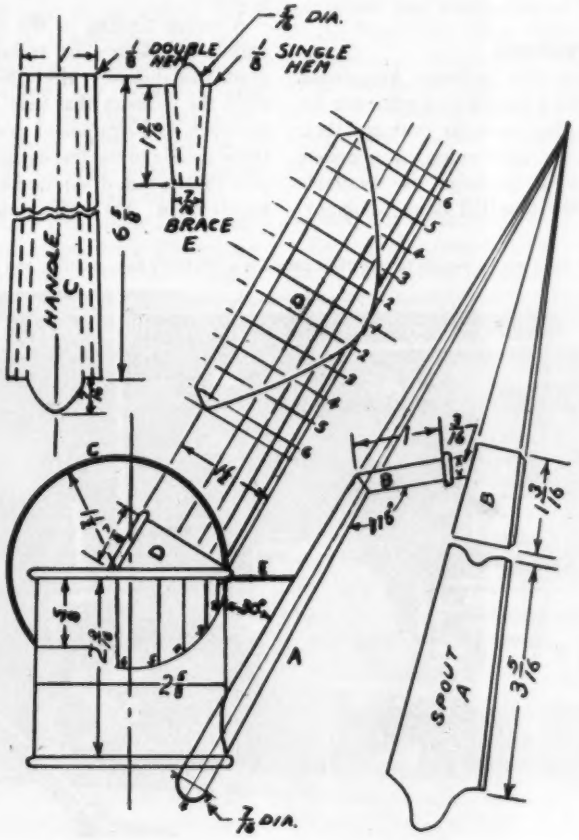
*By Ruthford E. Smuts*
North Side High School, Fort Wayne, Indiana

MAKING florists' watering cans is one of the most unusual and successful projects we have ever used in our general metals shop. It has been so appealing that our boys have usually made three of them: one as a keepsake, one for their parents, and one as a gift. This has led us to use assembly-line techniques for their production.

The educational benefits stemming from this project are many. For one thing, the boys have learned to make a worthwhile project. They have learned to use metal-forming equipment, to solder, and to paint metal. Furthermore, they have also gained some insight into the social, economic, and industrial implications of mass production. Each boy has been challenged to do his best to gain approval from his peers for the part he played in the production. They have learned the importance of what constitutes good workmanship, plus its many ramifications: accuracy, design, utility, safety, production, leadership, initiative, selfconfidence, and cooperation, to name but a few.

A brief description of how we did it follows:

We had 25 youngsters in our ninth-grade and tenth-grade general-metals classes, the level at which we did this job. The boys elected their own general foreman. He, in turn, chose three subforemen: one to lead production of the various parts (bodies, spouts, hoods, handles, and braces); another to lead assembly of the parts; and a third to lead cleaning and painting of the assembled watering cans.




Each job was first analyzed and the operations were then listed on a chart. The patterns were developed from the drawing at left and templates were made. Special tapers used were ¼", 5/16", and ⅜" per foot. The spouts were formed over these stakes.

We used three different sized cans for the bodies. The Heinz, or Campbell's, soup can (empty, naturally), was ideal for the small-sized watering can. The familiar #2 tin we learned was ideal for the medium-sized job, and the five-pound Crisco can had the capacity for the big watering can.

Salvaged cans from nearby filling stations provided us with metal for the spouts, hoods, and handles. We removed their tops and bottoms with can openers, cut them down the sides, flattened them in forming rolls, and trimmed them with squaring sheers. The double seam was not trimmed from some of the pieces because it was used as the top edge of the hood, thus making it unnecessary to fold a hem as shown on the drawing.

The various parts were laid out from templates and processed. The hems were turned on the handles and braces on the bar folder. The handles and hoods were formed on the forming rolls. All of the paint and labels were removed from the soldering points. (A wire buffing wheel or metallic cloth worked well for this.) Small reinforcement rings for the ends of the spouts were of copper made from proper-sized copper tubing (fuel lines), or were made from a narrow strip of metal that was wrapped around the spout and then soldered in place.

With flower time *nearly* here, this project is not only timely but also has great take-home appeal. ★

Industry recommends standards for

# Equipping Electronics Shops

*By Paul B. Zbar*

New York Trade School, New York City

THE remarkable growth of the electronics industry during the past ten years has presented industrial education with a challenge and an opportunity.

In this article I want to share some of the conclusions I have arrived at—after five years' research—concerning the quality of existing electronics-training facilities and equipment found in school shops and laboratories. The conclusions, and subsequent recommendations, relate directly to the quality of teaching, a subject in itself. Suffice it to say, however, adequate facilities and equipment generally go hand in hand with proper teaching. This article, therefore, will deal primarily with equipment. It is based on electronics-industry recommendations and should serve as a guide for administrators and teachers who are anxious to bring their facilities up to date and to improve electronics training in their communities. It is directed toward those leaders, too, who are introducing electronics training to their schools.

The relegation of electronics training to "left field" in many shops can be attributed to several causes, some of which are: its relative newness, lack of space in schools built before the "electronics era," shortage of properly trained instructors, and a general lack of appreciation or understanding of the great need in industry for people properly trained in the science. The significance of this article—its premises and conclusions—should be that it is the responsibility of industrial-education leaders on the local level to apprise their schools' administrators of the needs for proper equipment, space, and instruction. Furthermore, these needs have to be reevaluated constantly in the light of improvements and changes in the state, status, and art of the industry.

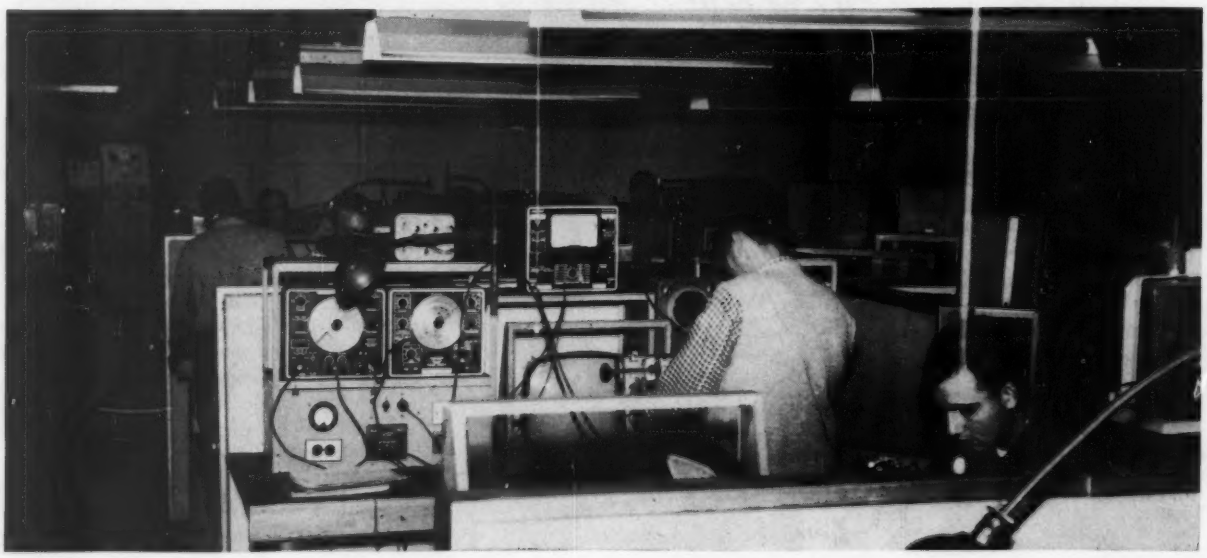
## Guides Available

The Electronics Industry Association has compiled a standard of reference for educators who want to evaluate their instruction in electronics. A complete preemployment package is available from the McGraw-Hill Book Company. It consists of comprehensive laboratory manuals in basic electricity, basic electronics, basic radio, and radio-receiver servicing, and basic television and television-receiver servicing. Accompanying these manuals are instructor's guides containing recommendations for shop and equipment set-up as well as comprehensive instructional outlines. Incidentally, this instructional material is now in use in some 35 states.

Schools that are planning to introduce electronics training in their industrial-education programs will find this material particularly helpful. And schools that are presently teaching electronics will find these industry-developed standards helpful in evaluating their training programs.

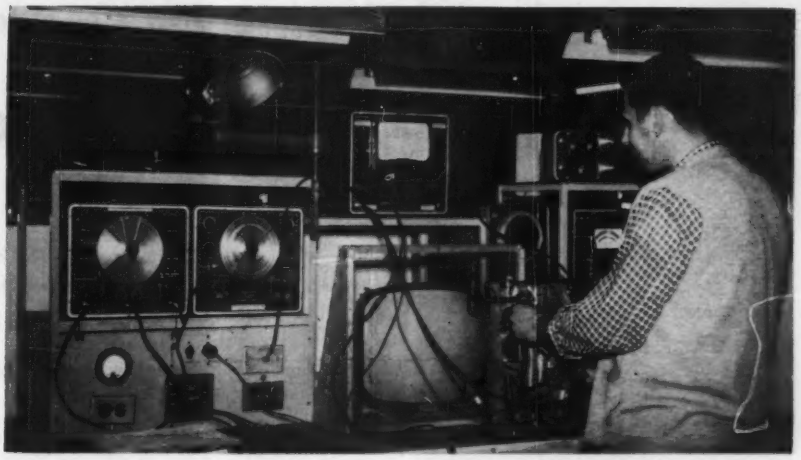
A major finding of the five-year research of electronics training is that graduates discover after they have entered the industry that they lack a basic knowledge of equipment and are oftentimes unable to use test equipment on the job. Proper use of equipment is a basic requirement. Not only must a student

Well equipped electronics-training shops are needed to properly train young people to take their places in a relatively new, exciting, and dynamic field.



become completely familiar with equipment in a school situation but there must be enough of it available so that all students can learn to use it.

What has been discussed up to now served our school in good stead when we were planning our electronics-training facilities. Details of layout, power requirements, test-bench dimensions, stockroom facilities, storage shelves, etc., can be found in the *Instructor's Guide* for *Basic Television and Television-Receiver Servicing,* published by the McGraw-Hill Book Company, Inc., and the *Instructor's Guide* for *Advanced Television Servicing Techniques* published by John F. Rider Publisher, Inc. And now, on to the test-equipment requirements for an electronics shop.



Financial barriers may prohibit setting up a unit shop for electronics training and quite often this can be overcome by combining it with a television shop where some equipment is available.

### Two Classifications

Test equipment can be classified as fixed and roving. Fixed equipment is used in day-to-day work at the test bench. Each bench should have a complete set of fixed equipment and for best results it should be permanently fixed to the bench. Roving equipment is usually stored in the stockroom and should be readily available to students.

*Fixed Equipment.* — Industry-recommended standards include the following pieces of equipment for each bench:

Oscilloscope: For monochrome television a high-gain scope with a band width of 500 kc is adequate. For color work, a wide-band scope is desireable. Matching probes are required and should include direct, low-capacitance, and demodulation probes. The oscilloscope should contain some internal provision for voltage calibration.

VTVM: The VTVM should have sufficient ranges for measuring d-c and a-c voltage and resistances of various values. Other desirable features that should be included are zero centering on the d-c function, and peak—peak to peak—a-c readings.

Sweep and Marker Generators (and Marker Adder): The sweep generator should provide coverage in the 20-mc to 30-mc and 40-mc to 50-mc ranges for IF amplifier alignment as well as coverage for each of the VHF channels. In UHF areas, a separate UHF sweep generator is required. Desirable features on a sweep generator are a blanking "on-off" switch plus properly terminated output cables.

The marker generator should have facilities for frequency calibration. It should provide a c-w and a-m signal in the same frequency range as the sweep generator for marking the IF amplifier and television tuner-response curve and for aligning the stagger-tuned circuits.

The process of marking a response is simplified by the use of a marker adder. This auxiliary piece of equipment is highly recommended.

Low Impedance Bias Box: This piece of equipment is essential in alignment and in servicing AGC circuits, both in monochrome and in color receivers. It should be line isolated.

Isolation Transformer: An isolation transformer is a must wherever series-filament-type receivers operating off the a-c power line are found in the shop. At the New York Trade School there is an isolation transformer mounted at every test bench. The transformer protects the student as well as the equipment against shock hazard. It should be rated at 275 v.a. at least.

### Second Classification

*Roving Equipment.*—The following listing of roving equipment contains suggested quantities based on the number of test benches in the shop:

VOM: Each bench should have one of these, each to be rated at 20,000 ohms/volts, with high voltage and r-f probes.

Dot and Bar or Crosshatch Generator: One of these should be provided for each bench.

Tube Testers or Combination Tube-and-Transistor Testers: One for every five test benches is an adequate ratio. The shop should also have one CRT tester and transistor tester.

Selenium Rectifier Tester: two for every 15 test benches.

Capacitance Tester: one for every five test benches.

Field Strength Meter: two for every 15 test benches.

Wattmeter: one for every five test benches.

Audio Oscillators: two for every 15 test benches.

Variable Auto Transformer: two for every 15 test benches.

Flyback Testers: two for every 15 test benches.

Oscilloscope Voltage Calibrator: one calibrator for every five scopes that do not have selfcontained facilities for voltage calibration.

Naturally, it would be better to have electricity, electronics, and radio training carried in a unit shop. However, it is understandable that in many instances this is impossible for a variety of valid reasons. So, where economic considerations—space, financial, and otherwise—prohibit unit-shop organization of the program, the training facilities can be combined with television-service training—where *some* of the needed equipment might already be available.

Test-instrument requirements for a separate shop will be listed and, again, in terms of fixed and roving equipment.

### For the Unit Shop

*Fixed Equipment.*—A complete set of the following is required for each test bench: oscilloscope, VTVM, am-signal generator (covering the broadcast-band frequencies and also covering the fm range), isolation transformer, and power supply.

*Roving Equipment.*—The following is needed: VOM (one for each bench), tube tester or combination tube-and-transistor tester (one for every five benches), capacitance tester (one for every five benches), selenium-rectifier tester (one for every five test benches), audio oscillator (one for every five benches), oscilloscope voltage calibrator (for those oscilloscopes without internal

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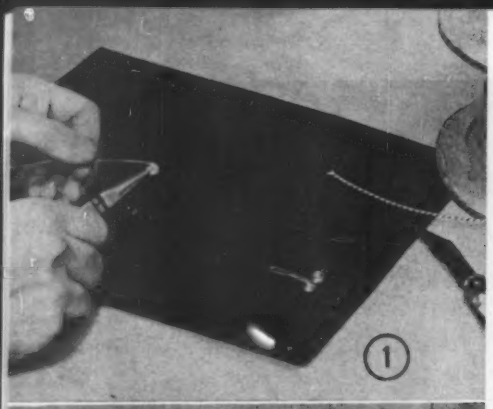
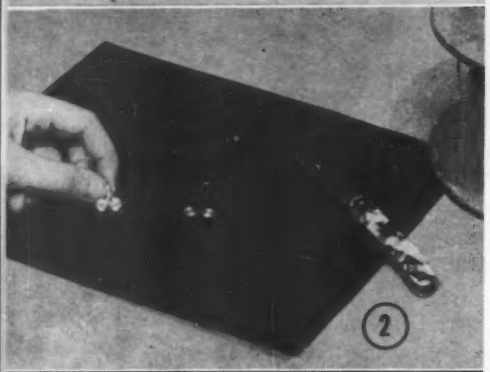
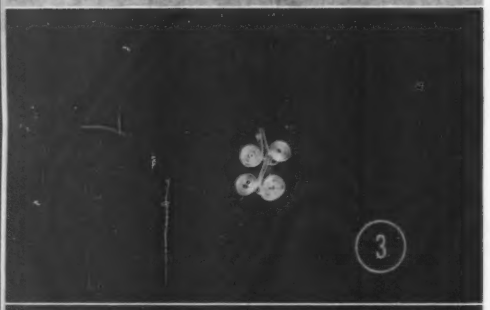
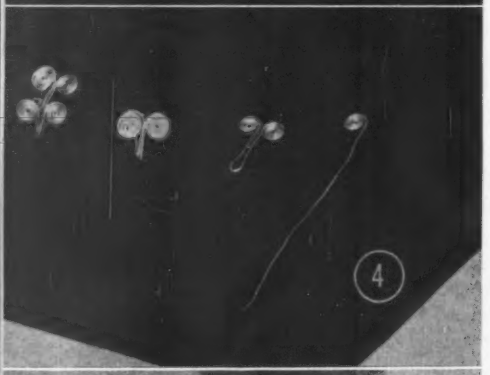


'Twas once merely a bit of scrap, but now 'tis

# Jewelry—Made of Wire

*By Harry J. Miller*

Sarasota, Florida, on leave from Gillespie Junior-High School, Philadelphia, Pennsylvania

FEW art or shop projects are as salutary in promoting creativeness as those which present a challenging activity for children and their consequent thrill of possessing and exhibiting their handiwork.

Such is the meaningful educational activity involved in working with wire. With simple tools and materials, a little patience, and a hank of copper wire like that used to connect electric bells, wire sculpture and jewelry can be made to come alive in even the most sparsely outfitted crafts room. And the shiny, pliable wire, purchased at any electric supply or hardware store, results in chokers, bracelets, and necklaces certain to bring the happy thrill of accomplishment which is so important a part of education.

Since wire comes in different weights, the jewelry may be delicate or bulky, and it won't tarnish. In schools which boast electroplating as part of the general shop, the wire ornaments can be silver plated. In some cases, members of the class may group their creations and have the teacher cart them off to a local jeweler or plater where the silver may be applied for a nominal sum.

Very often, the school's general shop is the source of wire and bits of metal. Children may even be encouraged to scrounge for some of these at home.

Not only does bell wire come into focus as a medium for creative expression, but aluminum or galvanized wire, brass, or stovepipe wire are equally versatile for shaping into pieces born of imagination and inventiveness.

For example, the making of a bracelet or necklace begins by using pliers to cut up dozens of 7″ lengths of wire. Holding the very tip end of the wire in a pair of pliers, make a tight coil by bending the wire around itself, as shown in Fig. 1. Coil one end clockwise. Coil the other end of the 7″ piece counterclockwise, leaving an inch of straight wire between the two coils, shown at left in Fig. 2.

With an icepick, bend the straight part into a "tongue", as at left in Fig. 2. Then bend the tongue toward you, as at left in this picture, to form a hook, with the hook lining up with the center of the coil. This makes the first link of the chain.

These hooks link over each other until the chain is long enough for a necklace or bracelet.

Fig. 3 shows the first two links put together. The chain-like side is the back, and the double row of coils goes outside.

Fig. 4 shows the various steps, and since these links all come out the same size, they are suited for bracelets or necklace ornaments. However, as in Fig. 5, the links have been made in pairs, with each pair half an inch shorter than the preceding pair, thus accounting for the shape. In this case, the beginning links started out by being 9″ long.

Make a fastener for the chain of 7″ links by using a 9″ wire, instead of 7″, allowing for a longer hook which slips sideways into the first link to fasten.

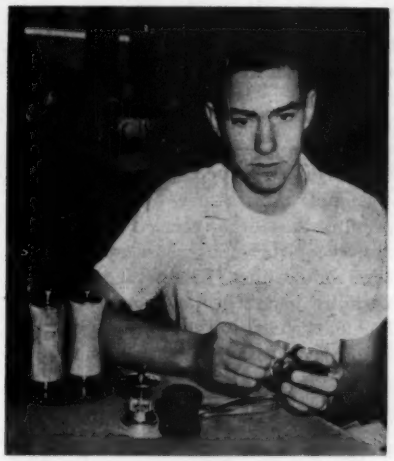
To slope the finished necklace, slightly bend it lengthwise over a forefinger.

At the bottom of the choker seen in Fig. 5 is a piece of aluminum (and this could be a section of thin copper pipe), from which has been cut out the owner's initials. For this job, use a jeweler's saw and a V-shaped wood block fastened to a work-bench top, or clamped to a table.

For girl students, pin and earrings may be made to match by bending coils in the same manner, but leaving no straight part for the hook. Glue two of these to the back of an ear screw (these are obtainable at "five and dime" stores), or glue them to a blank pin.

Similarly, the distaff side could make a belt or trimming for dresses, hats, and other clothing.

Thus, this project aids in exploring materials and engenders a respect for wire which may suggest a wide range of activities. It could be suggested to children that, besides spawning an original creation for themselves, wire jewelry makes acceptable gifts for family and friends. ★



Assembling a pepper mill. This has become a popular project in southern California shops.

# Pepper Mills

*By Marion Avakian*

Head, Industrial-Arts Department, San Fernando, California, High School

THE school in which I teach woodshop is part of the Los Angeles city-school system. We have pioneered in the application of industrial arts for training students to make projects that are very nearly duplicates of similar products manufactured in our part of the country.

At least 100 of our students have made pepper mills, for instance, that meet standards and specifications of the George S. Thompson Company of South Pasadena, Calif. The firm manufactures pepper mills on a commercial basis and furnished our students with mechanisms for their pepper mills.

Starting from scratch, in every sense of the word, many of these students' woodshop problems started in their own back yards. They have cut citrus and fruit-tree woods from their own yards, cured the wood, polished it, sculptured it and then fitted them with the grinding mechanisms.

While shop activities have not been restricted to pepper mills, they have been very popular. They are comparatively easy to make, have real use in students' homes, and pepper-mill manufacture—professionally—has become a tradition in our locality.

To date only eleventh-grade and twelfth-grade boys take shop but we feel it will not be too long before girls ask to join us to at least make pepper mills. ★

**Students to the right and students to the left**

# Horseshoe Bench

*By Dan J. Menning*

Franklin Junior-High School, Cedar Rapids, Iowa

NOT too long ago when we built a new eighth-grade general shop, we were faced with the problem of designing a fixture suitable for a "demonstration-instruction area." After teaching eighth-grade general shop for more than 10 years I was determined to incorporate this area in our new shop.

The inspiration for this horseshoe-shaped table came from a coffee bar I stopped at in Missouri once, on my way to do a two-week tour of duty in the Naval Reserve. I am sure you have seen lunch counters, etc., that are made in many shapes, beautiful in function and form.

The cost of materials for our table was $135. Labor was extra. We have used it for two years now and the following are some of the advantages of the table we have discovered:

1. All students have unobstructed views of the blackboard, demonstration, or visual aid.

2. Demonstration equipment can be easily wheeled inside of the horseshoe.

3. Students can easily see visual aids on a wall screen that is painted above the blackboard (not visible in the photograph).

4. Students have a good writing surface for note-taking during demonstrations or when visual aids are part of the classwork.

5. Each boy has his assigned seat.

6. Organized demonstration periods —each student is assigned a comfortable seat at the bench—cuts down on the activities of the "squirmers" and "wrigglers."

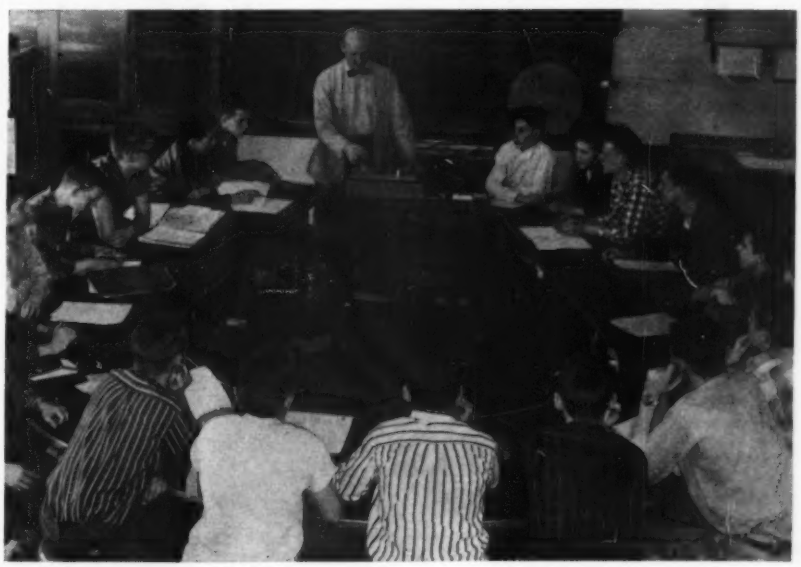
7. The work counter is ideal for doing tests and special planning jobs. Electrical outlets are spaced at intervals under the outside rim.

8. The storage space under the bench top—inside of the horseshoe—is accessible with a minimum of effort.

9. The teacher's leg work is cut because he teaches both the right and left sides of the bench at the same time.

We hope this idea might be of help to you. ★

A horseshoe-shaped bench showing storage facilities beneath. The clear, unobstructed view each student has of the teacher, as well as of the blackboard, compels close attention by all students.



# Diamond Dust

Abrasive comments from that doughty Scot, Tom Diamond, former head, Department of Vocational Education, University of Michigan, Ann Arbor.

**Educational Headache**

SCHOOL people are all too familiar with that educational headache, the semi-annual report card. It brings joy to some, but is distressing to many, both pupils and parents, who had hoped for better things. It is not surprising, therefore, that beginning shop teacher Tim Healy was disturbed when he realized that the end of the semester was approaching and he would be faced with the problem of assigning to each pupil a grade that would convey to the pupil what Tim believed was a fair evaluation of his work.

As he thought about this responsibility, he began to realize that the only information he had on which to base these grades existed in his mind. He remembered that George had turned out an excellent project and that Bill had not done so well. However, both projects had been taken home and he was unable to recall clearly the extent to which they varied in quality of workmanship.

In due course the time for turning in grades arrived and Tim, having no factual information available, had to use his judgment on the matter. This method was quite satisfactory from the standpoint of those who received high grades. However, when the grades were low, it brought down on Tim a deluge of protest that his judgment was poor. Since he had no evidence to support his judgment, his critics finally convinced him that he may have erred, and that perhaps little Freddy should have had a *C* instead of a *D*.

Tim felt humiliated because his judgment had been questioned, so he resolved that, henceforth, when the final grading period arrived, he would have in his files evidence to enable him to satisfy his critics that his grades were based on the reaction of the pupils to the requirements of the course.

With this in mind, he decided that he must begin at once to prepare for the marking period. As he thought about what he should do, the idea occurred to him that he would have to decide on what bases the final grades would be founded. Would he use his judgment, as he had done before, or should he decide what factual information he should have about the pupils and their work that would enable him to point out to each pupil specifically why he was given the grade he received?

Having made the decision to collect evidence, Tim began to think of the facts he believed to be important for his purpose. How well did the pupil do on each project? How many projects did he complete? Did the pupil have to turn in certain reports? How satisfactory were they, and were they turned in on time? Did the pupil make progress, and how much? Was he cooperative? Was his behavior satisfactory? Did he show initiative? How did he do on the tests that were given? Facts about these, and perhaps other questions, would be recorded, and a summary of them would constitute a firm basis for whatever grade was given. By this means each pupil would be building his own history, and Tim would have a factual picture that would make it possible for him to explain to the pupil how his final grade was determined.

Tim did not suggest that his approach to grading was scientific, but, after having his plan in operation for some time, he has started to approach the problem of establishing final grades with confidence.

It is not our purpose to go into the

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theory of grading pupils, but most teachers are compelled to submit grades for their pupils, in one form or another. While Tim's procedure and conclusions may not be acceptable to our experts, they at least suggest that you, as a teacher, might profit from following his example.

Are you quite sure that the grades you gave to Bill and Bob reflect accurately the respective achievements of each? Do you have the facts to support your decision? ★

*happenings in industrial education*

### Expansion Plans

THE permanent industrial-arts building at Long Beach State College, Calif., is now in its final design stage. Construction of the $1,500,000 building is expected to begin this spring and should be completed in a year. Equipment for the building, which will accommodate 246 students, will cost $300,000.

Plans call for a $1,500,000 addition to the building in the 1961-62 budget year.

### Safety Meeting

REPRESENTATIVES of 60 professional organizations attended a three-day invitational meeting in Washington in April to explore ways in which schools can contribute to occupational safety through their shop programs.

The safety program formulated at the meeting will be considered by the 1960 President's Conference on Occupational Safety to be held in Washington next spring. Major topics considered by the delegates included leadership development, safety committees, physical patterns, instructional materials, and teacher education.

### Foundrymen Center

A building to house the Training and Research Institute of the American Foundrymen's Society is being planned in Des Plaines, Ill. Ground breaking is expected late this year.

The Training and Research Institute, operating as a foundation, will be the first such school in North America, owned and operated by the industry, to provide foundry job training, both apprentice training and up-grading training for industry.

### Technicians in Oregon

SIX local centers in Oregon have either started or will soon start post-high-school area vocational programs for technicians under provisions of the National Defense Education Act of 1958.

The schools involved are the Central Oregon College at Bend and schools at Coos Bay, Salem, Astoria, Portland, and Medford. ★

### Convention Calendar

**Georgia Vocational Association,** Biltmore Hotel, Atlanta, June 11-12.

**Colorado Vocational Association,** Colorado State University, Fort Collins, June 15-19.

**Virginia State Vocational Conference,** Virginia State College, Petersburg, June 22-26.

**Pennsylvania Vocational Association,** Eagles Mere Hotel, Eagles Mere, June 23-25.

**Louisiana Vocational Association,** Capitol House, Baton Rouge, Aug. 13-17.

**Industrial Arts and Trade and Industrial Education Conference,** Virginia Polytechnic Institute, Blacksburg, Aug. 17-19.

**Conference on Printing Education,** International Graphic Arts Education Association, University of Colorado, Boulder, July 19-25.


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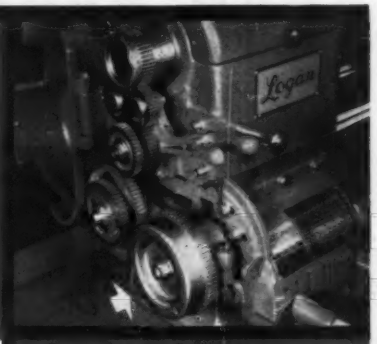

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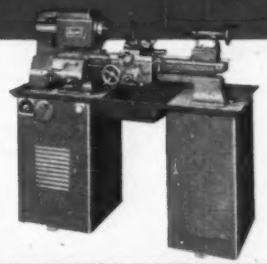

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**Philippines** . . . . . *from page 10*

agricultural in nature. Nearly 80 percent of the population derives its livelihood either directly or indirectly from the land. In spite of this fact not enough food is being raised to feed the rapidly growing population. The result is that much rice must be imported. This places a severe drain on the Republic's already overburdened financial structure. Unemployment is consistently high, and the over-all standard of living is low as compared to United States standards. As a result there is a desperate need for industrialization. Most raw materials are plentiful in the Islands, and the native Filipino could readily adapt himself to industrial occupations. The material advantages of an industrial society are well known to the Filipino and he has a strong urge to own automobiles, radios, and other types of manufactured articles. However, the importation of such goods in large quantities is impossible because of the unfavorable trade balance.

It appears that industrialization can be brought about in only two ways. Either foreign capital must be encouraged to develop the natural and human resources of the Philippines, or exports must be increased to improve the trade balance. Since the present government policy seems opposed to the large-scale investment of foreign capital there remains only the second alternative. Because the major products are, at present, agricultural, this means that agricultural production must be increased.

In light of the need for increased production, it appears that industrial arts can, for the present, make its greatest contribution by cooperating with and improving agriculture. There are many ways in which this can be done. Boys can be taught to improve and repair transportation equipment and farm implements. The farm home can be improved and made more sanitary. Better means of communication in the rural areas can be developed. While any one school or pupil can do little, the combined efforts of thousands of schools and a million or more pupils can have a tremendous effect.

Industrial arts can also help in the development and improvement of the home industries. Because of the high level of unemployment, thousands of Filipino families are without regular income for long periods during each year. To supplement their earnings many families have developed home industries using locally available materials. At the present time only a small part of the product is suitable for export. With slight improvements in design and by employing some simple machines and devices to speed production, however, many of these articles could compete in the world's markets. Industrial arts can contribute significantly to improving home industries.

A third contribution that industrial arts should make is in the improvement of the industrial-arts program itself. In many cases the shop is in a building that is badly in need of repair. A lot of experience, with high educational value, might be derived from the improvement and reconstruction of the shop building. Tools are scarce and expensive, but native tools from available woods can be made by the pupils. Many desirable skills and attitudes can thus be developed. The program at Iloilo School of Arts and Trades is now placing great emphasis on development of tools and equipment that can be made and used in smaller schools.

The major efforts of the Stanford Team are being directed toward preparation of teachers who appreciate what industrial arts can and should do for the Philippines, and who are willing and anxious to make their contribution. ★


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*Teach modern methods with these strictly modern lathes that eliminate all hand belt shifting and deliver even the new high speeds with the touch of a button.*

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*It is a precision lathe moderate in price with the versatility for safely teaching both beginning and advanced students.*

**SHELDON** *Variable Speed* **PRECISION LATHES**

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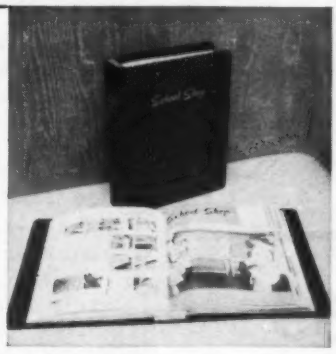

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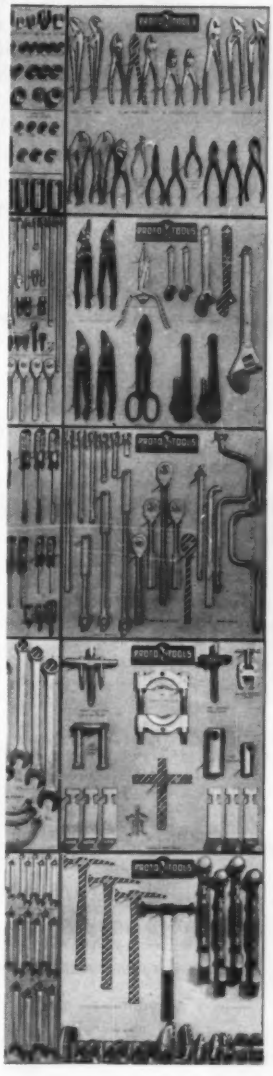

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**Equipping** . . . . . *from page 13*

facilities for voltage calibration—one for every five scopes), wattmeter (two for every 15 benches), auto-radio power supply (battery eliminator—one for every five benches), vibrator tester (one), signal tracer (one for every five test benches).

### Shop Financing

Completely modern shops can be equipped at relatively low cost. Thus, it has been estimated that the cost of all test equipment, hand tools, stockroom tools, small parts, and television receivers is somewhat less than $1,000.00 per test bench for a 15 bench shop. A test bench is normally used during any laboratory period by two students working together as a team. The total cost of equipment, tools, etc., for a separate electricity-electronics-radio shop is about $600 per test bench.

Kits have their place in the school program that we have been discussing here. For an instructive article along these lines I refer you to "Kits Can Be Shortcuts," SCHOOL SHOP, January, 1957. To broaden the list of kit manufacturers listed in the article I suggest addition of PACO Electronics Company, Inc.

Kits are particularly useful as term projects for students wishing to build their own personal equipment. It has been my experience, though, that for teaching purposes in school shops, commercially built test equipment is better.

My purpose in this article has been to acquaint industrial-education teachers and administrators with industry-recommended teaching and equipment standards. I would also like to suggest that present programs and facilities be evaluated in the light of these recommendations, and that an effort be made to bring programs and facilities in line with these standards.

I am fully aware of the reality that upgrading means more money. It is my conviction, though, that school boards will seriously consider requests for funds when the need is substantiated and documented by what the, electronics in this case, industry believes is needed to train young folks for a place in a relatively new, exciting, and dynamic field. ★


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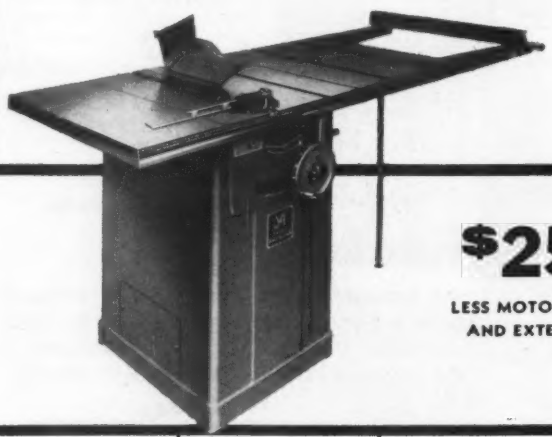
Gets almost double work surface from solid table extensions: over 25" in front of blade with mitre gauge extended. Rips 3 1/8" stock with blade at 90°. The only 10" tilting-arbor circular saw using standard NEMA frame motor, up to 3 HP: more production, no vibration, no kickbacks.



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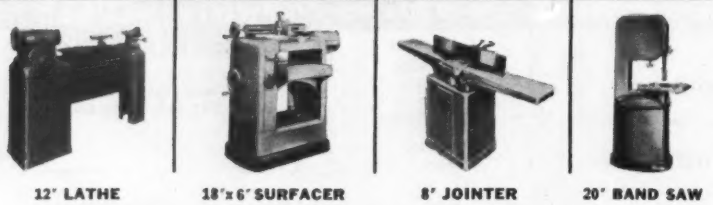

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GILBERT WEAVER, director of vocational training, New York State Department of Education, has announced his retirement in June.

ROBERT W. SLOANE, formerly with the Division of Veterans Education in Kentucky, is now Kentucky state coordinator of T & I education in the Division of Industrial and Distributive Education.

JOE B. NEELY has succeeded SAM W. KING, resigned, as assistant director of industrial education for the Texas Education Agency. Mr. King is now serving as western regional agent in the U.S. Office of Education, T & I Branch.

HELEN LIVINGSTONE, former industrial-teacher trainer for women in the New York State Education Department, died in January at the age of 81. Miss Livingstone was one of the leaders who helped form the women's section in the T & I Division of the American Vocational Association.

J. LYMAN GOLDSMITH, supervisor of vocational and practical arts, Los Angeles City Schools, Calif., was awarded the Ship's Citation as the outstanding leader in industrial education in California for 1959 at the recent California Industrial Education Association Convention in Stockton.

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An ARMSTRONG Wrench feels right—is balanced. It goes over nuts or screw heads easily, grips firmly without sloppiness, won't round corners—because openings are carefully machined to correct sizes. It's safe, strong beyond need without clumsy bulk—because of superior design and selected steels, heat treated to proper degree of hardness and tensile strength. It's quality finished, ARMALOY (alloy steel) Wrenches in chrome plate with heads buffed; HI-TEN (carbon steel) Wrenches in baked-on gray enamel with heads ground bright . . . all plainly marked for size. All are uniformly excellent tools manufactured under strict quality control, by modern methods, with modern equipment in a modern tool plant . . . 1537 different industrial sizes and types —single wrenches, or sets in metal cases, boxes or rolls . . . each a quality tool. Armstrong Wrenches are "Fine tools that encourage good work."

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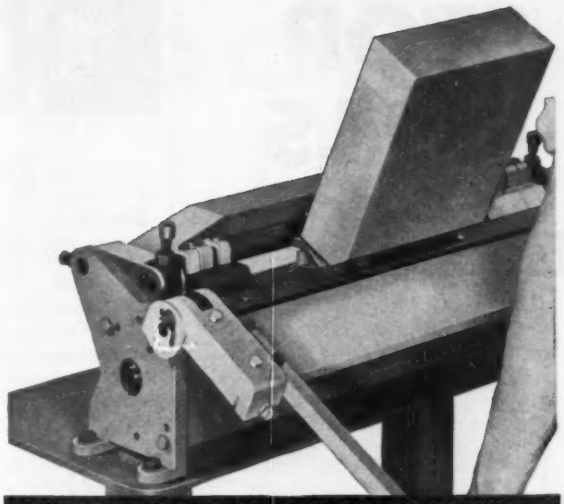

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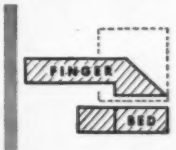


Ten box fingers cover box forming range from ¾" to 24" in steps of ¼". Each die-steel finger has its own clamp and can be mounted anywhere on the finger mount bar—no holes to register. One-inch clearance between fingers and bottom plate for easy insertion and removal of material. Parts fully warranted.

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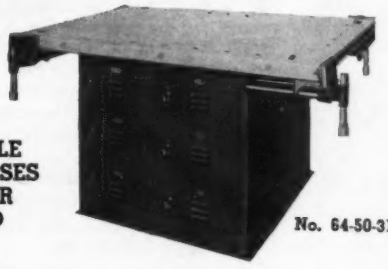

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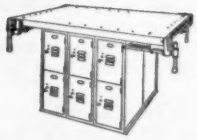

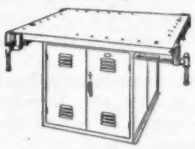

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# *instructional* Resources

***Books:***

**Sheet Metal Layout Simplified.** Vol. III. Reid. Ann Arbor, Mich.: Edwards Brothers, Inc., 1958. Pp. 240. $6.50.

This book is designed to help the reader learn, at home or in the shop, the science of triangulation. It covers a four-year apprenticeship course in pattern layout for the sheet-metal trades.

Projects included are fittings used in everyday shop practice. Each problem is illustrated by a two-view drawing; a simplified method is shown clearly identified for easy transfer to the pattern.

All patterns are fully developed, each line of the pattern is lettered to correspond to the developed lines on the triangles.

Each problem has a written step-by-step explanation on how to construct the drawing, how to find true length of each line required for the pattern, how to transfer the line from triangle to exact position on layout, and how to form pattern to required shape.

Hugh B. Reid is a practical sheet-metal designer, and is an instructor of sheetmetal drafting, Wilbur Wright Technical Institute, Detroit, Mich.

**Course Making in Industrial Education.** (Second Edition.) Friese. Peoria, Ill.: Chas. A. Bennett Co., Inc., 1958. Pp. 299. $4.00.

This book will serve as a text and as an instruction manual. It will be helpful to both industrial-arts and vocational teachers as they prepare their courses, or when they review their present courses with a view to improving them.

This edition has been revised to bring it into harmony with new ideas developed during the past decade.

John F. Friese is professor of industrial-arts education at Pennsylvania State University, University Park, Pennsylvania.

**Industrial Arts for Grades K-6.** Gerbracht and Babcock. Milwaukee: Bruce Publishing Co., 1959. Pp. vi+160. $3.50.

The main purpose of this book is to assist elementary-grade teachers, who lack experience in industrial arts, to further enrich the general curriculum.

While it was designed for use by teachers who are in training, it will be of value to teachers in service who feel the need for clarification of the industrial-arts activity concept. They will find also that it is a ready source of information on methods of proceeding with a program.

It contains suggestions of several projects which come within the ability of pupils in the lower grades, as well as points to be considered in planning and equipping the room for the work.

Carl Gerbracht is professor of industrial arts education and Robert J. Babcock is coordinator of elementary industrial arts at Teachers College at Oswego, New York.

**How to Troubleshoot a TV Receiver.** (Second Edition.) Johnson. New York: John F. Rider Publisher, Inc., 1958. Pp. vii+150. $2.50.

All of the excellent features of the original edition of this book have been retained, and two new chapters have been added. The first of these chapters deals with portable TV receivers, vertical chassis, and printed circuits. The second new chapter deals with trouble-shooting TV picture tubes, continuing spot of light, "snivits," and other irksome problems.

Both beginners and experienced servicemen will find ideas in it, ideas of value to them.

**The Role of Physical Maturation in Determining the Ability of Junior-High School Boys to Perform Complex Finger Coordinative Activities in Industrial Arts and an Index to Level of Ability.** Fuzak. Chicago: American Technical Society, 1958. Pp. 109. $1.50.

This is a significant piece of research which should be of interest to all teachers in the field of industrial arts. The results of this five-year study indicate that the degree of physical maturity attained by beginning shop pupils frequently determines their ability to master the manipulative processes required for successful shop work.

It provides an effective method for teachers to measure physical maturation in beginning pupils. Complete information on the use of the method, and the interpretation of the results are also included. The report won first prize of $1,000 in the American Technical Society's Research Awards Program.

John Fuzak is Professor of Industrial Education, Michigan State University, East Lansing.

**The Practical Dictionary of Electricity and Electronics.** Oldfield. Chicago: American Technical Society, 1959. Pp. viii+216. $5.95.

This dictionary is designed to provide a compact practical reference work. It includes the basic trade vocabulary of the many fields in which electricity and electronics are applied.

In addition there is included a section containing those formulas, tables, symbols, and current diagrams that are in constant use by individuals working in the fields of electricity and electronics.

Teachers will find that it provides students with a wealth of information that is indispensable to anyone engaged in one or the other of the areas covered.

R. L. Oldfield is a technical writer, and was formerly an instructor at American Television Laboratories of California.

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# Requesting New Equipment

*By E. J. Brune*

**Industrial Technology Department, Western Michigan University, Kalamazoo**

I NEED some equipment in my shop but I just cannot get it." No doubt you have heard this sentiment muttered quite often. Perhaps you have even said it yourself at one time or another.

Every conscientious industrial-arts instructor is constantly thinking about and planning ways to improve his curriculum. And it is this thinking and planning that quite often brings him face-to-face with the reality of meeting the "holder of the purse strings." And very often the meeting has ended with a teacher being rebuffed. A very unpleasant experience to say the least.

This rebuff from a "ruthless" and "unsympathetic" boss in the front office can be frustrating, and even devastating; progress can be discouraged very easily. And, tragically, very often the beaten ego draws its only nourishment from fault finding and bitterness, both poor substitutes for positive and creative thinking.

Before this unpleasantness is allowed to drive friends away and to overpower any vestige of happiness that might be left, a few moments should be devoted to analysis of the situation. One hypothesis that might be tested is: "Was the requisition carefully planned and well thought out?"

Before making a request for new equipment, the instructor should review his entire program. Just two of many questions that he can ask himself in this review are: What should I teach? Why do I include certain areas of instruction? Other questions will suggest themselves. The resulting reevaluation will lead to the next step: request of new equipment.

It seems that a list of information should be collected and arranged in a comprehensible form for use when making new-equipment requests. This will take a little time but the pay-off can be rewarding. A suggested outline for this information is shown in the form below. It's worth a try.

**Requisition Information**

1. Name of equipment _____
   a) Make or brand _____
   b) Size _____
   c) Type _____
   d) Accessories _____
2. Total Cost _____
3. Superior qualities of make requested _____
4. Number of hours for use daily _____
5. Number of students benefited _____
6. New learning processes involved _____
7. New skills involved _____
8. Related areas of instruction _____
9. Frequency of use of equipment in industry _____
10. Employment prospects for skills learned _____
11. National employment outlook _____
12. Remarks _____ ★

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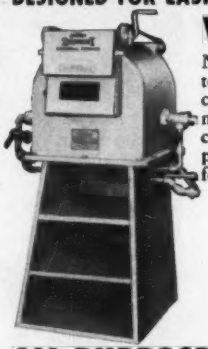
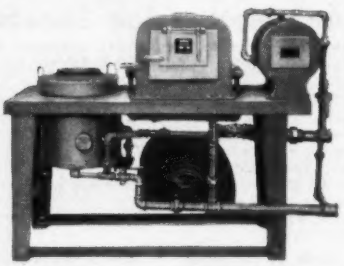


No. 128 Wide Range Oven provides wide temperature range; 300° F. to 2400° F; covers practically every phase of heat treatment. Can be used for annealing, pack carburizing, hardening, preheating, tempering and general heat treating. Ideal for general school use.



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## AIAA Requests Regents Reverse Decision Affecting Santa Barbara S.C.

THE American Industrial Arts Association at its 21st annual convention at Long Beach, Calif., passed a resolution requesting the University of California Board of Regents to reverse its decision regarding discontinuance of industrial-arts teacher training at Santa Barbara State College in 1963.

The convention also went on record designating itself as a clearing house for assisting students seeking scholarship aid to help them achieve careers as industrial-arts teachers.

Both resolutions passed at the general business meeting at the conclusion of the convention held in Long Beach Municipal Auditorium. More than 1300 registrants attended the meeting, April 22-25.

The Ship an organization of commercial exhibitors in the industrial-education field, also passed a resolution requesting reconsideration of Regential action to stop industrial-arts teacher training at Santa Barbara State College.

Other action taken by the convention included the following:

John Metz, retiring editor of *Industrial Arts and Vocational Education*, was cited by the convention for his service to the profession. He has been editor since 1927.

Kenneth W. Brown, director of industrial arts at State College for Teachers at Buffalo, N.Y., was named "Man of the Year" in industrial-arts education.

John Whitesell, Miami University, Oxford, Ohio, and Burl N. Osborn, State Teachers College Millersville, Pa., were awarded honorary life memberships in AIAA.

AIAA officers elected for 1959-60 are: M. Ray Karnes, University of Illinois, Urbana, president; Ivan Hostetler, North Carolina State University, Raleigh, first vice-president; William Wilkinson, director of industrial arts, Wallingford, Pa., vice-president for classroom teachers; Kenneth W. Brown, executive-secretary and treasurer.

Officers of the American Council on Industrial Arts Teacher Education elected for 1959-60 are: John Fuzak, Michigan State University, East Lansing, president; Paul Hiser, State Teachers College at Oswego, N.Y., vice-president; William Tierney, University of Maryland, College Park, executive secretary; Donald Lux University of Illinois, treasurer.

The 1960 AIAA convention will be in Toronto, Ontario, Canada. ★


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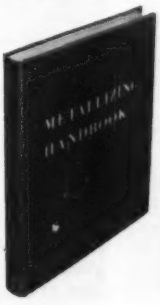

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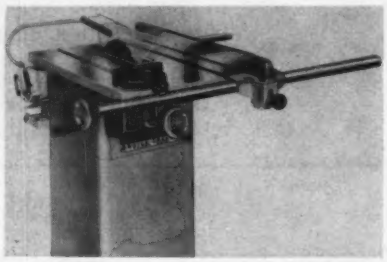
# news from Industry

(Circle the numbers on the card in this issue to secure the items listed.)

## Boice-Crane's Challenger Saw Has New Drive System

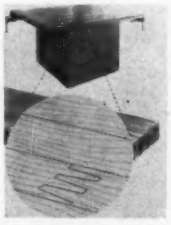
A full-floating, frictionless, rolling motor-drive delivers all the power to the blade in the new Challenger 10" tilt-arbor saw recently introduced by Boice-Crane Company.



The company asserts that constant belt tension is provided, and vibration and belt distortion and wear are reduced to a minimum. The 10" blades now retract fully below the table without the added tension loads on the belt or bearing, Boice-Crane adds. Other features of the saw claimed by the company include: more capacity to the gages, an improved trouble-proof ripping gage, and auto-positive clamping to maintain split-hair accuracy.

For more information write the company, 938 Central Ave., Toledo 6, Ohio, mentioning SCHOOL SHOP; or *circle no. J-1 on the business-reply card.*

## Tolerton Introduces "Finger-Jointing"



"Finger-Jointing" is the name given by The Tolerton Company to its newly-announced method of jointing the maple strips used for laminating its bench tops.

Tolerton states that by this exclusive process all imperfections can be graded out of the finished piece, resulting in a bench top that is actually stronger than a solid lumber strip. It also claims that this method offers greater strength and durability than butt-jointing or other methods commonly used today.

For more information write the company at Alliance, Ohio, mentioning SCHOOL SHOP; or *circle no. J-2 on the business-reply card.*

## Dietzgen Offers Series of Geometric Models

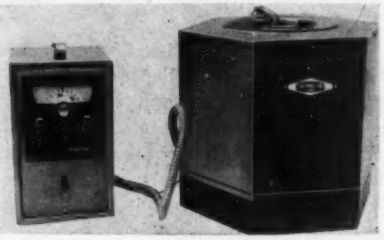
A series of easy-to-make geometric models for mechanical-drawing instructors has been announced by the Eugene Dietzgen Company.

Called, "New Dimensions in Mechanical Drawing," the series is designed to help students better understand and visualize the development of three-dimensional models by actually putting them together.

The models, the company reports, require no special equipment to assemble. Beginning with such simple forms as the tetrahedron and octahedron, the series will include progressively more complicated forms.

To receive copies of the models write to the company, 2425 N. Sheffield Ave., Chicago 14, Ill., mentioning SCHOOL SHOP; or *circle no. J-3 on the business-reply card.*

## Multipurpose Furnace

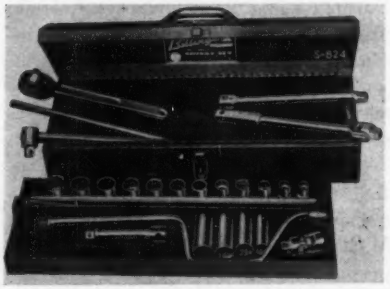


Type 2100 Thermolyne Furnace, recently introduced by Thermo Electric Manufacturing Co., is said by its manufacturer to be a new development in top-loading electric furnaces. It is a multipurpose unit, adaptable for use as salt bath, melting, vertical muffle, or crucible furnace.

The basic unit includes the hexagonal furnace, which operates on 115 or 230 v, a stainless-steel pot with cover and lifting handle, and thermocouple in protection tube. The chamber of the furnace, which has a 6⅝" diameter and is 11½"deep, has a maximum temperature of 1900° F for intermittent operation.

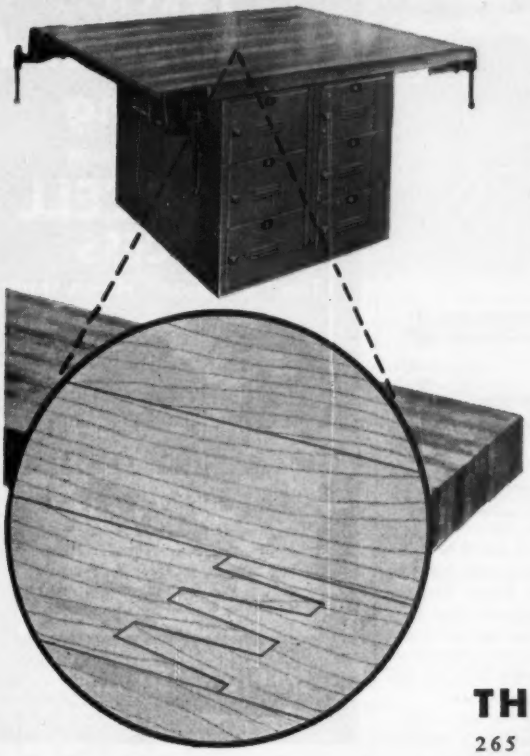
For more information write the company, 490 Huff St., Dubuque, Iowa, mentioning SCHOOL SHOP; or *circle no. J-4 on the business-reply card.*

## Billings and Spencer Offers Socket Set Boxes



The Billings and Spencer Company has announced a newly-designed metal box for its ½" square-drive Vitalloy forged socket sets Nos. S-824 and S-825.

The heavy-gage metal boxes have removable trays for holding sockets and the smaller extensions, universal joints, etc. The ends of the boxes have corrugated sections for hold-



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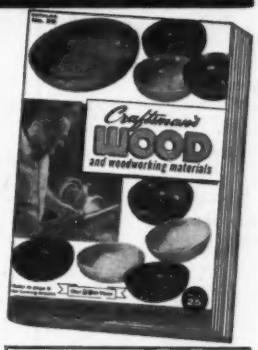


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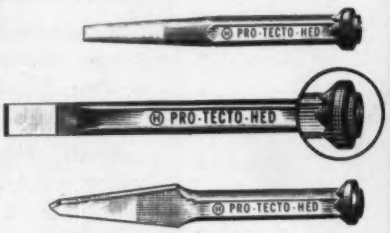
ing the trays, adding to the over-all strength of the box, the company states. The carrying handle is securely fastened to the pyramid-designed cover, it adds.

For more information write the company at Hartford 1, Conn., mentioning SCHOOL SHOP; or *circle no. J-5 on the business-reply card.*

### Pro-Tecto-Hed Chisels Feature Safety, Longevity

"The first real improvement in the design of chisels and punches for more than 50 years," is the claim of the Cincinnati Tool Company in announcing its new Pro-Tecto-Hed line of chisels and punches.




The raised "upset" head of the Pro-Tecto-Hed line defeats "mushrooming" and chipping, affording greater safety and longer life, the company asserts. The company adds that each tool is trip-hammer forged from special analysis steel and is specially tested for hardness and toughness. The tools comply with all federal specifications, the company states.

For more information write the manufacturer, Cincinnati 12, Ohio, mentioning SCHOOL SHOP; or *circle no. J-6 on the business-reply card.*

### Thompson Adds Nutmeg Mill Components to Line

The George S. Thompson Company has announced that components for nutmeg mills are now available.

In addition to the nutmeg mill, the firm says that components for coffee mills can be purchased in kit form, too. The pepper mill components, as well as the nutmeg and coffee mill parts, are said to be excellent school-shop projects.

For additional information write to the firm at 509 Mission St., S. Pasadena, Calif., mentioning SCHOOL SHOP; or *circle no. J-7 on the business-reply card.*

### Low-Cost Auto Transformer Unusually Compact

Standard Electrical Products Company has recently introduced a low-cost auto transformer that measures 3⅞" x 3⅞" x 3½", the specifications show.

The range of the PA-1 auto transformer gives a 0-132-v output, and the PA-1L model ranges from 0-120v, both from a 120-v input. Maximum output current for both models is 1.25a. Maximum load rating for PA-1 is 165va and for the PA-1L it is 150va, the specifications indicate.

The transformers are toroidally wound type with LoRes brush track, which, the company says, assures longer life and are useful when-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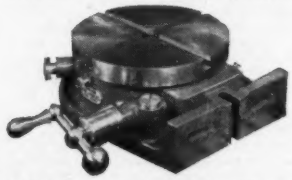

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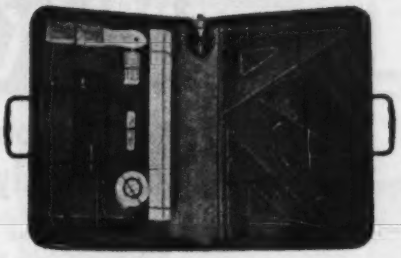

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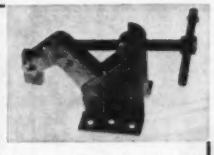

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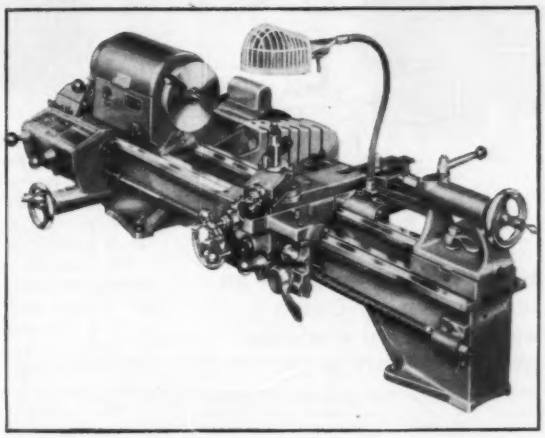

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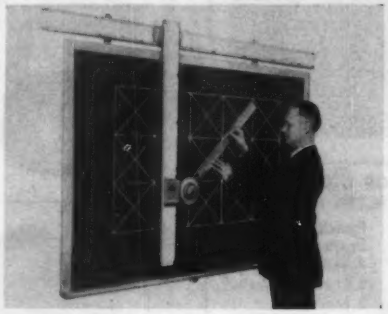
ever variable a-c voltage is needed in the shop.

For further information write to the company at 2240 E. Third St., Dayton, Ohio, mentioning SCHOOL SHOP; or *circle no. J-8 on the business-reply card.*

### Universal's Tracmaster Used for Chalkboard Teaching



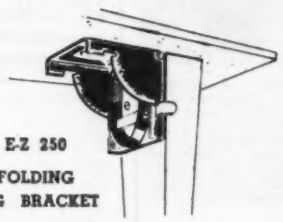
Universal Drafting Machine Company states that its new Tracmaster quickly, easily, and accurately measures and plots lines directly on the chalkboard.

The drawing aid, the company goes on to say, is specially helpful in teaching drafting.

The machine glides smoothly across the board, horizontally and vertically, with perfect balance and accuracy of angle and dimension. The protractor and scale rotate freely, locking in position at any drawing angle, the manufacturer states.

For additional information write to the firm at 7960 Lorain Ave., Cleveland 2, Ohio, mentioning SCHOOL SHOP; or *circle no. J-9 on the business-reply card.*


**NEW!!**



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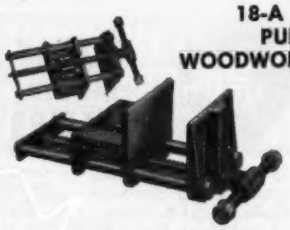
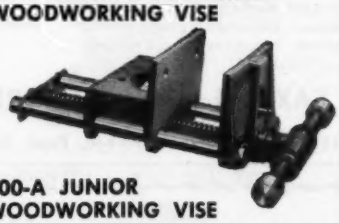


18-A DUAL PURPOSE WOODWORKING VISE



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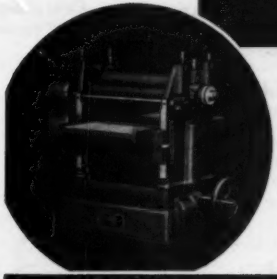

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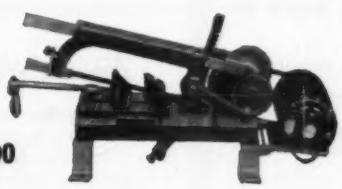

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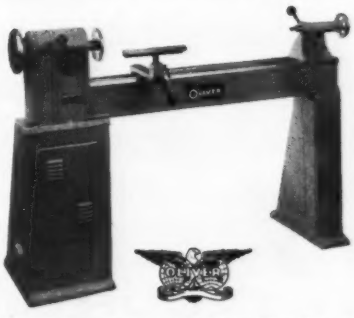


*"OLIVER" — famous for Precision Machinery*

### Unitron Microscope Has Shop Applications

The Unitron Instrument Division of the United Scientific Company has issued a list of applications for its binocular stereoscopic microscope in school shops.

The firm states the instrument can be used to check and inspect surfaces before and after finishing, engravings, cavities and pits, cracks, stampings, tool cutting faces (woodworking and metal), metal-to-metal joints, wood and paper fibers, etc.

The firm also says that because of the depth of focus and long working distance, the operator can see through the microscope while he manipulates parts, as in assembly of small items.

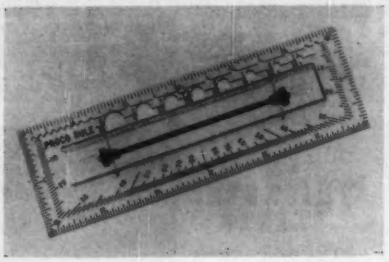
For more information write to the firm at 204-206 Milk St., Boston 9, Mass., mentioning SCHOOL SHOP; or *circle no. J-10 on the business-reply card.*

### Fullerton Engineering Introduces the Proco Rule

The Fullerton Engineering Company has recently introduced the Proco Rule, a rolling ruler that takes the place of all drafting tools for small drawings, the company says.

The specifications show that the Proco Rule can be carried in a pocket, thus making it available for immediate use on any flat surface.

The roller construction of the rule carries the rule in a straight line on any flat surface.



A scale at each end permits easy, accurate spacing of parallel lines. Besides other measuring features, the rule also has a template for small circles and provides a method for making larger circles up to 6" radius.

For more information write to the firm at 4623 York Blvd., Los Angeles 41, Calif., mentioning SCHOOL SHOP; or *circle no. J-11 on the business-reply card.*

### Ajusto Adds All-Metal Stool for Schools to Its Line

The Ajusto Equipment Company announces the addition of its new line of Ajax, all-metal, fixed-height stools for schools.

The company states the stools are designed for long use, with carefully engineered assembly assuring rigidity. They are made with an 18-gage, 13"-round steel seat that is bolted to the leg assembly. Legs are ⅞", 16-gage steel tubing that is electric arc-welded to the 16", 18-gage steel footring. Leg assembly is held at the top by 8 steel rivets, the specifications show.

For additional information write to the firm at 515 Conneaut Street, Bowling Green, Ohio, mentioning SCHOOL SHOP; or *circle no. J-12 on the business-reply card.*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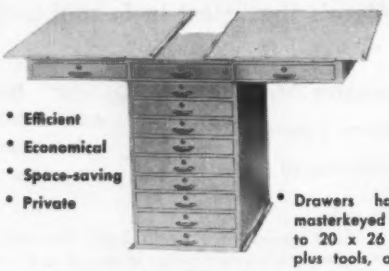

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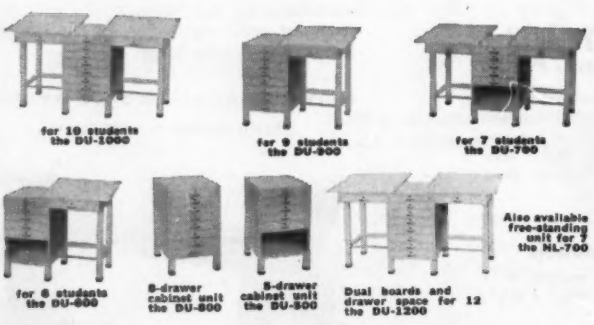
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## New Literature:

**Catalog No. 839** is the descriptive catalog recently published by the Challenge Machinery Company that lists more than 300 precision surface equipment items handled by the firm. Included are both semisteel and granite surface plates, as well as angle plates, V-blocks, benches, etc. For your copy write to the company at Grand Haven, Mich., mentioning SCHOOL SHOP; or *circle no. J-13 on the business-reply card.*

**Catalog No. 58** is the new catalog recently published by Lussky, White & Coolidge, Inc., that is devoted to information about cabinet and drapery hardware. For more information write to the firm at 214-216 W. Monroe St., Chicago 6, Ill., mentioning SCHOOL SHOP; or *circle no. J-14 on the business-reply card.*

**Description and Price List** of the items for bookbinding, rubber stamp making, and silkscreen work sold by the G. A. Pratt Company is available by writing to the company at 1108 W. Chicago Ave., E. Chicago, Ind., mentioning SCHOOL SHOP; or *circle no. J-15 on the business-reply card.*

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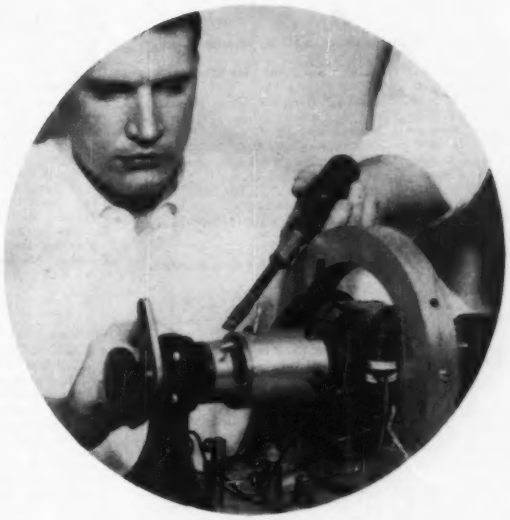

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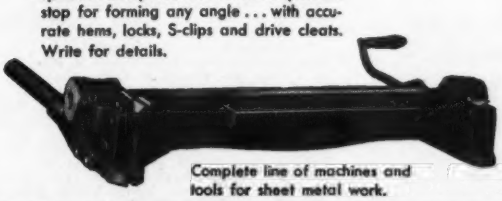

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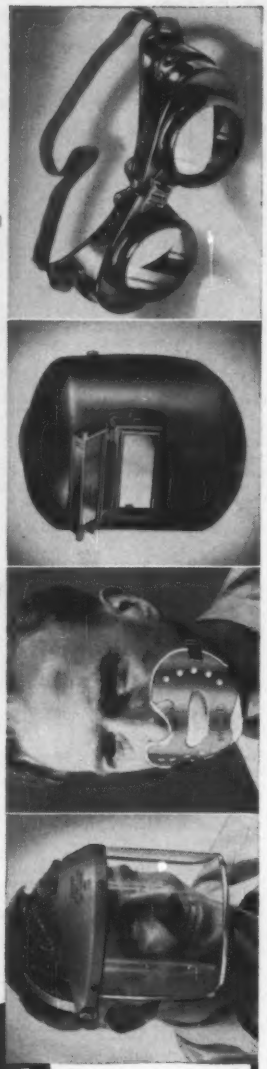

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**Washington . . . .** *from page 40*

curriculum guides dealing with industrial arts. Some are dated as early as 1951, some as late as 1958. They cover elementary and secondary grades. No guides came from Alaska, Colorado, Maryland, Massachusetts, Montana, Rhode Island, South Carolina, Tennessee, Vermont, and Washington. But New York State sent in as many as 16; Minnesota, 11; Ohio, 9; and Georgia, 5. Four were in Spanish—from Puerto Rico, naturally.

The typical state curriculum guide carries no surprises, the annotations show. Thus, Alabama's course of study is for grades one through twelve; contains statements of objectives; and (among other material) topical suggestions for content in metal working, mechanics, and clay products. But the guides are by no means uniform. Florida calls one of its documents the ABC's of Industrial Arts, and answers questions about purposes, advantages, programs, and cost. In one of the California guides you'll find kindergarten units on the circus; and one of the Minnesota items prints a history of industrial arts in that state.

The staples of industrial arts are well covered in most of the guides, and you'll find no lack of material on ceramics, electricity, metal, printing, textiles, wood, leather, and plastics. We also noted references to safety in the school shop (in the California and Florida guides, for example); to planning school facilities (in the New Jersey, Michigan, and Ohio guides); and to scheduling (Ohio).

For Mr. Schmitt, the preparation of this annotated bibliography is only one step in a larger study of industrial arts from the national point of view. He next


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plans to dig deeper into these state curriculum materials and see what they recommend in objectives, content, time allotments, course, organization, and scheduling.

**"Marching Orders" Issued.**—We have before us a statement from the National Safety Council that says: "Accident problems of schools and school-age youth will reach a peak in the next decade." The reasons: more school kids, more emphasis on manipulative activity in classroom, laboratory, and shop, more elaborate equipment in courses devoted to practical arts.

We have before us also a document, prepared one year ago, called The President's Conference on Occupational Safety. It records the proceedings of the meeting held in Washington March 25, 1958. Time and again, this document says, in effect: "Let's carry out the recommendations made by the first President's safety conference in 1949."

And, finally, we have before us the agenda for the conference on the school's contribution to occupational safety through shop-safety programs scheduled for April 16, in Washington.

These three documents all but cry for a story of where we stand on safety in the school shop today.

And here we meet a sad fact. Ten years ago, the first President's safety conference made a dozen or so recommendations for school-shop safety. Nary a one has been carried out in full, though some progress had been made on one or two of them.

And so, today ten years later, the conference that was scheduled for April 16, 1959, had a clear goal: to get action started on these 1949 recommendations on which nothing had been done; and to complete action on those recommendations on which a modicum of progress had been made.

A few days before the April conference was to start, we talked to Howard K. Hogan, of the U. S. Office of Education. This able career educator had been named project coordinator, meaning that he was responsible for getting the machinery for the safety conference underway. At the time we talked to him some 40 organizations had agreed to send representatives. Also lined up were the chief greeters and the chief statement-makers. But more important, the marching orders for the conference were ready. And these consisted of pinning down commitments, of deciding who was to be responsible for what.

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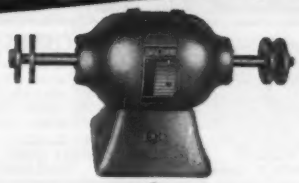

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Commitments to what? Responsibility for what?

Ten years ago the President's Safety Conference recommended that standards be prepared for machine guarding. Ten years ago, too, the President's conference recommended standard student-accident forms. Still other recommendations, ten years ago, urged regular and frequent school-shop safety inspections; the creation of state-wide and local shop-safety committees; and the assignment of responsibility for school-shop safety to at least one person in each state department of education.

There were other recommendations, too: including such diverse items as making safety a part of teacher training and inservice programs; and introducing safety information as part of state and national conventions of industrial educators.

To repeat, since little had been done during the past decade to move these recommendations toward reality, another attempt was to be made at the April conference to commit organizations to taking on specific responsibility for the unfinished business of 1949.

"What we hope to come out with from this conference," says Mr. Hogan, "is first of all a steering committee that will coordinate the efforts for safety as we block them out at the April conference.

"Second, we should come out with a guide for action—a set of marching orders for the organizations and groups that are taking part in this conference. We should come out with a long 'To Do' list, not just for the next several months but for the next several years."

It would not be fair to leave the impression that the 1949 safety conference had left no impact. One of its important outcomes was the development of a national standard school-shop safety-inspection checklist. Experts judge it to be a useful instrument. Here and there it has been put to work with good results. In some school systems, the inspection checklist has been used by the shop instructor himself; in others it has been used by student committees, local fire department officials, or by other safety-minded individuals. But the trouble is that the checklist is not being used widely enough. Large numbers of school people do not even know of its existence; and others who did know, have forgotten. Let this, then, serve as a reminder: "Yes, Mr. Teacher. There is a school-shop safety-inspection checklist." And this checklist was prepared as far back as 1952 by a joint committee of the American Vocational Association

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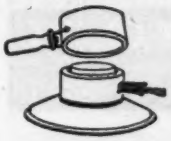
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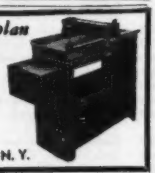

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and the National Safety Council.

Another product of the President's conference of a decade ago is the standard student-accident report form, and the comments above, associated with the inspection checklist, would apply also to the accident report form.

**The Top Ten.** — Working with Mr. Hogan, as a special consultant to this year's safety conference, was William A. Williams, on leave from Pennsylvania State University. At the time we talked to Mr. Williams, he was embroiled in the details of helping set up the machinery for the forthcoming meeting. The administrative details, however, did not overwhelm Mr. Williams' deep and scholarly interest in school-shop safety.

A few questions revealed that Mr. Williams was the source of a rich mine of information about safety in the school shop. A doctoral thesis he was developing at the time carried the title (and we abbreviate it here) "Present Status and Preferred Practices in Safety Education." This document contains 176 such practices. Without going into the details of how Mr. Williams arrived at them (except to say that their identification was an elaborate and sound procedure) let us look at the top ten. Paste these in your hat. Tack them on the wall. And next September take steps to put them into effect so that no pupil of yours will appear on an accident list next year.

1. Prohibit running in the shop at any time.
2. Prohibit horseplay or practical jokes of any kind in the shop area.
3. Develop permanent safety consciousness in students through teacher example—always doing things the safe way.
4. Prohibit grinding of any kind without wearing safety goggles or safety glasses.
5. Provide fire extinguishers in the shop area.
6. Enclose all gears, moving belts, and other power transmission devices with permanent guards or barricades.
7. Require students to report all accidents to the teacher, regardless of nature or severity.
8. Make all equipment control switches easily accessible to the operator.
9. Provide a ground on all motors, fuse boxes, switch boxes, and other electrical equipment.
10. Present safety instructions with the following objective in mind: developing in each student a sense of personal responsibility for his own safety and that of others. ★


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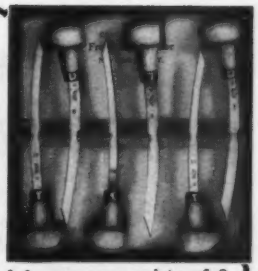

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# from Washington

*by Michael Paca*

**Incident of "Significance".**—Nothing much of importance has happened to the pending measures in which educators have an interest. But one incident on Capitol Hill has been described as "significant" and we might as well look into it.

When President Eisenhower asked the House Appropriations Committee for $75,000,000 to keep the National Defense Education Act moving, Rep. Albert Thomas (D., Tex.) sneered. Mr. Thomas is chairman of a subcommittee that has been described as a fund-slicing unit, although its title carries the word "appropriations" in it. Mr. Thomas doesn't think much of the defense education act. He persuaded his fund-slicing group to slice the President's request from $75,000,000 to $25,000,000 and to earmark that for student loans only. "Loans is the most important part of the defense act," Mr. Thomas told the rest of the House "and therefore has been approved . . . The remainder of the sum has not been approved . . . Congress should proceed with caution," Mr. Thomas continued, "before embarking on large-scale support of programs such as grants for statistical studies, testing, and classroom facilities."

When the news of this proposed reduction got around, the House leadership sat back and waited, but those who had a vested interest in the activities of the defense education act neither sat back nor waited. Something like a popular revolt broke on Capitol Hill. Interestingly a cabinet member was at the head of this outcry. Said Secretary Flemming: "This cut if sustained would amount to a repudiation of the sense of urgency that led to the passage of the act." The mail reaching Congressmen late in March was heavy with protests from people concerned with science, math, foreign languages, testing, audio-visual aids, statistical studies, and guidance. Note the types of people who protested, because here lies the significance of the incident. These are people who had already developed a vested interest in the act and were not willing to see that interest threatened.

On March 24, the full House restored the cut.

The comment heard most frequently following this "significant" incident was: "At last, general educators have learned to act like vocational people . . . When their Congressional support is threatened, they speak up loud and strong."

**Otherwise, All's Quiet.**—But as we said, nothing much of importance has happened to the other pending measures in which educators have an interest—neither to the area-development bill, the Murray-Metcalf measure, nor the batch of bills dealing with juvenile delinquency that Congress has undertaken to study late in the session. Congress will go home without doing much about any of them.

**State Curriculum Guides.** — What would state departments of education like to see local schools do in industrial arts? That is one of the questions Marshall L. Schmitt, U. S. specialist in industrial arts, set for himself. To get the answer he asked state departments of education to send him their state curriculum guides and Mr. Schmitt has been examining them for the past several months. First thing Mr. Schmitt did with these documents was to prepare an annotated bibliography and send it on to press. We have examined the proof sheets of this forthcoming 33-page document and pass on a few of the facts as we saw them.

The states submitted a total of 125

(*Continued on page* 36)

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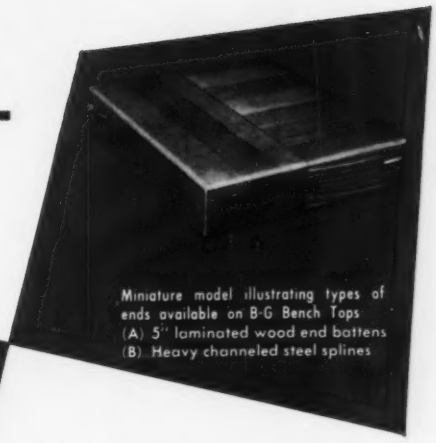

Miniature model illustrating types of ends available on B-G Bench Tops
(A) 5" laminated wood end battens
(B) Heavy channeled steel splines

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